Geophysical Research Abstracts,
Vol. 10, EGU2008-A-01675, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-01675
EGU General Assembly 2008

Ostracoda as proxies of late Quaternary climate change in the Ponto-Caspian region

I. Boomer (1)

(1) School of Geography, Earth & Environmental Sciences, University of Birmingham, Edgbaston, B15 2TT, UK

Recent studies have shown that the Ostracoda are the most abundant and diverse calcareous, benthonic organisms recovered from cores in the Black, Caspian and Aral seas. These large 'inland' water bodies (a restricted epicontinental settign in the case of the Black Sea) constitute the modern Ponto-Caspian region. The three seas have largely evolved independently of each other and today each has a distinct hydrology that is, to a greater or lesser extent, governed by climate, the Aral Sea is somewhat different in that recent changes have been dominantly anthropogenically-driven.

The Caspian and Black Sea ostracod faunas are related to Neogene Paratethyan and Pannonian forms while the limited Aral Sea fauna is largely derived from more recent chance migrations. Ostracods recovered from sediments in these seas have allowed us to build up a detailed palaeoclimatic history for each water body over the last few thousand years. In addition to traditional faunal studies, ostracods have been analysed for their trace-element and stable-isotope composition to trace the hydrochemical evolution. Ostracods have also been used within these studies to provide carbonate material for radiocarbon dating. In the following pages examples are given from each of the Black, Caspian and Aral seas to illustrate how a multiproxy approach – mostly using ostracods – can help elucidate major past hydrological changes.

Ostracods recovered from cores in the Black Sea are witnesses to the marked hydrological changes in that basin. They respond to the well-known, early Holocene 'flooding' of the Black Sea via the Bosporous as Mediterranean sea-levels rose high enough to reach what had been an isolated, internal basin during the last glacial phase.

The ostracods also record late-glacial flood pulses into the basin prior to the marine connection event.

Ostracods from the deep-water central and southern basins of the Caspian Sea record variations in the isotopic composition of water flowing in from the Volga River catchment, the main surface input (contributing $\sim$80% of the total), over the last glacial-interglacial transition. The pattern and scale of changing isotopic values suggests a strong North Atlantic influence on precipitation in the Volga Basin during this period.

In the Aral Sea, ostracod diversity has crashed in recent decades as salinity has increased from about 10 ppt in 1960 to more than 100 pt today. Evidence from a number of cores shows that the ostracods have also responded to previous variations in the level of the Aral Sea, both natural and anthropogenic controlled. The ostracods have been used to radiocarbon-date these past changes and to quantify past hydrochemical events putting the most recent environmental crisis into a longer-term perspective.